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(54) **Turning Tool**

(57) The cutting component is made of a flat plate (3) with two opposing cutting heads (3A, 3B) equipped with a longitudinal support board (7A, 7B) and connected by an oblique median part (3C) with two oblique support boards (9A, 9B) tilted 45° from the longitudinal axis. The tool body (1) has one free end equipped with a housing that has a flat bedding surface supporting the plate (3) and two longitudinal and oblique support surfaces (11, 12) that engage the boards (7B, 9B). The plate (3) is directly attached by a screw (4) to the flat bedding surface.

[insert diagram]

## CLAIMS

1. Turning tool with an elongated tool body, a cutting component equipped with two opposing cutting heads and engaged in a housing at the free front end of the tool body, and a tightening screw related to the cutting component and the tool body, characterized as follows:

- (a) the cutting component is made of a flat plate (3) equipped with two parallel flat base surfaces (6A, 6B), two longitudinal support boards (7A, 7B) on either side of the cutting component, and two opposing cutting heads (3A, 3B) each related to one external longitudinal support board (7A, 7B), and connected by an oblique median part (3C) of this plate;
- (b) said plate (3) presents a symmetrical configuration in relation to a transverse central axis (8), such that the position of said opposing heads (3A, 3B) is reversed by a 180° rotation in the plane of the plate (3), around this central axis (8);
- (c) said oblique median part (3C) of the plate presents a trapezoidal shape that is laterally delineated by said longitudinal support board, (7A, 7B) and transversely by two parallel oblique support boards (3A, 3B) tilted toward the rear of the tool body (1);
- (d) the free front end of said tool body (1) is designed such that it presents a protruding part with a reduced section supporting the active cutting head, that the housing (2) is open to the top, on one side, and to the front of the tool body, and that it presents a flat bedding surface (10) corresponding to the base surface (6A, 6B) of the plate (3), an internal longitudinal support surface (11), which engages a support board (3B) related to an inactive cutting head (3B) oriented toward the rear, and an internal oblique support surface (12) that engages an oblique support board (9B) related to this inactive head (3B); and
- (e) said median part (3C) of the plate and said tool body (1) are equipped with holes aligned on said central axis (8) and related to said tightening screw (4), all such that the cutting component is positioned by said bedding surfaces and said support surfaces of said housing and such that the tightening screw (4) directly acts on said plate (3) and ensures the direct attachment of the cutting component to the tool body.

2. Turning tool according to Claim 1, characterized in that said internal oblique support surface (12) of the housing forms an angle that is between 40° and 50°, preferably equal to 45°, in relation to a longitudinal plane passing through said transverse axis (8).

## DESCRIPTION

The present invention is intended as a turning tool with an elongated tool body, a cutting component, equipped with two opposing cutting heads and engaged in a housing at the free front end of the tool, and a tightening screw related to the cutting component and the tool body.

Turning tools of this type covered in the invention have the advantage of allowing the permanent attachment of the cutting component, thereby avoiding the inconveniences of brazing the cutting component on the tool body, which is the technique currently used to date.

This type of turning tool also allows for very easy replacement of the active cutting head when it becomes worn, by turning the cutting component such that the position of the opposing cutting heads is reversed with the inactive head brought to the front in the position of the active cutting head. The cutting component may also be replaced very quickly by simply unscrewing and rescrewing. It then becomes possible to use the same tool body successively with several different cutting components, without significant deterioration of the cutting tool, thereby allowing significant savings.

Despite the advantages noted for this type of turning tool, cutting components attached through brazing of the tool body are still commonly used.

The present invention is intended to provide a turning tool with an interchangeable cutting component of said type, which significantly simplifies production of the entire tool and attachment of the cutting component.

To this end, the turning tool covered in the invention presents the characteristics defined in Claim 1.

Various forms of execution of a turning tool according to the invention are described below as examples using the attached drawing, in which:

Figure 1 is a view from above of an initial form of execution for a turning tool according to the invention;

Figure 2 is a side view of the form of execution according to Figure 1;

Figure 3 is a front view of the form of execution according to Figure 1;

Figures 4 and 5 are views from above of three variations of the cutting components adapted to the cutting tool according to Figure 1 to 3; and

Figure 6 is a view from above of a second form of execution of a turning tool according to the invention.

The turning tool represented in Figures 1 to 3 includes an elongated tool body, 1, the free front end of which is designed such that it presents a protruding part, 1A, with a reduced section (Figure 3) and a housing, 2, and a cutting component with two interchangeable opposing cutting heads, 3A, 3B, installed in the housing, 2, and directly attached with a central tightening screw, 4, engaged in a central hole, 4C, drilled into the plate and in a tapped hole, 5, of the tool body, 1.

The cutting component is made of a plate, 3, with two parallel base surfaces, 6A, 6B, laterally delineated by two longitudinal support bands, 7A, 7B, that are

respectively related to said opposing cutting heads, 3A, 3B, which are arranged on either side of said plate.

As depicted in Figure 1, the plate forming the cutting component, 3, presents a symmetrical configuration in relation to a transverse central axis, 8, that coincides with the axis of the screw, 4, engaged in holes 4C and 5.

Opposing cutting heads, 3A, 3B, represent a reduced section and extend longitudinally over a length allowing the desired turning, and are symmetrically fitted such that their positions are reversed upon 180° rotation around said axis of central symmetry, 8, in the plane of the plate forming the cutting component.

As seen in Figure 1, the plate, 3, is equipped with a trapezoidal oblique median part, 3C, delineated by two lateral support boards, which are part of said longitudinal support boards, 7A, 7B, and by two parallel oblique support boards, 9A, 9B, that are tilted toward the rear of the tool body, 1, and thereby form a 45° angle with the longitudinal plane transversing said axis of central symmetry, 8.

The cutting component formed by the plate, 3, presents an active cutting head, 3A, supported by the protruding part, 1A, with a reduced section of the tool body, and an inactive head that is placed in a groove, 2B, that is part of the housing, 2.

Said housing, 2, is open at the top, toward the front end and on one side of the tool body, 1, and has a flat bottom made of a flat bedding surface, 10, with a shape that allows it to support the base surface, 7B, of the plate, 3.

In the normal working position of the turning tool, said bedding surface, 10, is arranged horizontally (see Figure 3).

Said housing, 2, of the tool body, 1, is laterally delineated by an internal longitudinal support surface, 11, that engages the longitudinal support surface, 7B, related to the inactive head, 3B, and has a length that is greater than said board, 3B. This housing also has an internal oblique support surface, 12, that engages the oblique board, 9B, of the median part, 3C, related to the inactive head, 3B.

As depicted in Figure 1, the housing, 2, is formed by an elongated opening above the protruding part, 1A, serving to support the active cutting head, 3A, a trapezoidal flat cavity containing the median part, 3C, of the plate, and a longitudinal groove, 2B, containing the inactive head, 3B, while allowing longitudinal and lateral play, with both types of play called for so as to house these cutting components with cutting heads for which the width and length may vary within the limits of said play.

The turning tool according to the invention described above may be manufactured very simply and requires exact machining only to achieve the opposing longitudinal support boards, 7A, 7B, and the oblique support boards, 9A, 9B, of the plate, 3, and two longitudinal support surfaces, 11, and oblique support surfaces, 12, of the housing, 2, and holes 4C and 5 engaged by the tightening screw, 4, must be exactly aligned on the axis of central symmetry, 8.

Turning tool according to the invention described above presents an extremely simplified structure, which allows very quick and simple exact positioning of the cutting component, only through the use of its two longitudinal and oblique support boards, 7B and 9B, respectively. Moreover, solid attachment of the cutting component is very quickly and simply ensured, solely through a single tightening screw, 4, which acts directly on the plate, 3, integrating it into the tool body using the tapped hole, 5.

The plate, 3, making up the turning tool component according to the invention may be designed to perform different types of turning work, such as cutting off, sectioning, surfacing, threading, and sizing of grooves, for example.

Figure 4 depicts a variation of a plate, 3, representing a cutting component adapted to the turning tool according to the invention in order to provide a shaping tool. Apart from the rounding shape of the end of the opposing cutting heads, the cutting components represented in Figures 1 and 4 are made up of plates that each contain two opposing heads, 3A, 3B, a median part, 3C, base surfaces, 6A, 6B, and support boards, 7A, 7B, 9A, 9B, all like those already described.

Likewise, Figure 5 depicts a variation of a cutting component in the form of a plate adapted to threading work through a turning tool such as that described above. However, the end of the opposing cutting heads is pointed in this case.

Figure 6 represents a second form of execution for the invention, which is theoretically analogous to that already described, except that the plate, 3, making up the cutting component has a different configuration, with a shape that generally resembles the letter "Z". The plate represented in Figure 6 has two opposing cutting heads with transverse cutting ends 63A, 63B, that are connected respective to an oblique median part, 3C, through longitudinal parts, 3A, 3B. All components with the same reference numbers in Figures 1 and 6 are like those already described.

As shown in Figure 6, cutting ends, 63A and 63B extend transversally in opposite directions on either side of the cutting tool, 1. The housing of the tool body is fitted as a result and has a longitudinal groove, 2B, containing part 3B, an additional transverse groove 62B, connected to 2B such that it houses the complete inactive head 63B, 3B.

The fitting of a cutting component in the form of a plate in accordance with the invention allows a simplified turning tool, which is relatively easy to manufacture at an acceptable price.